Controls Over the Development of the Practitioner Secure Messaging System Prototype Should Be Improved

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DEPARTMENT OF THE TREASURY
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MEMORANDUM FOR COMMISSIONER ROSSOTTI

Pamela J. Gardiner

FROM: Pamela J. Gardiner
                    Deputy Inspector General for Audit

SUBJECT: Final Audit Report - Controls Over the Development of the
                    Practitioner Secure Messaging System Prototype Should Be
                    Improved

This report presents the results of our review of the Internal Revenue Service's (IRS) development of the Practitioner Secure Messaging System (PSMS) Prototype. In summary, IRS' Electronic Tax Administration (ETA) management developed the PSMS Prototype to support the design of a full-scale system that will provide a secure Internet environment for tax practitioners and the IRS to exchange tax information. The purpose of the Prototype is to provide information (such as lessons learned) to the related Business Systems Modernization Program Project that is building the full-scale secure messaging system. However, the Prototype's project management, oversight and spending controls need improvement.

IRS management responded to the recommendations presented in the report and is taking corrective actions to address the project management and spending control issues. However, IRS management did not agree with our recommendation to move the PSMS Prototype and similar ETA systems development initiatives to the Chief Information Officer's (CIO) organization. We believe managing systems development initiatives outside the CIO organization is inconsistent with the *IRS Organization Blueprint 2000*, which consolidates all systems development activities under the CIO. Conducting ad hoc projects or prototypes outside the CIO organization increases the risk of inconsistent and ineffective project management processes and fragmented systems modernization initiatives, which could lead to delays, cost overruns and rework.

IRS management's response has been incorporated into the report where appropriate, and the full text of the response is included as Appendix IV. In addition, Office of Audit

comments on IRS management's response have been included in the report and at the end of Appendix IV (page 29).

Copies of this report are also being sent to the IRS managers who are affected by the report recommendations. Please contact me at (202) 622-6510 if you have questions, or your staff may call Scott Wilson, Associate Inspector General for Audit (Information Systems Programs), at (202) 622-8510.

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Executive Summary

The Internal Revenue Service (IRS) Restructuring and Reform Act of 1998 (RRA 98)[1] requires the IRS to provide electronic tax account information to taxpayers who electronically file their income tax returns. The IRS' Electronic Tax Administration (ETA) Office started the Practitioner Secure Messaging System (PSMS) Prototype Project in December 1998 to develop a system that allows tax practitioners to use the Internet to request actions or information on their clients' tax accounts.

The overall objectives of this audit were to determine whether the PSMS Prototype was managed using sound project management controls and whether the PSMS Prototype was coordinated with the IRS Business Systems Modernization (BSM) Program, which is developing new IRS computer systems.

Results

The PSMS Prototype is the IRS' first system that uses the Internet to directly interact with the public to exchange taxpayer information. It is a research and development project with the purpose of determining the most productive way to securely receive and respond to tax practitioner requests over the Internet and to provide lessons learned to the IRS' full-scale secure messaging project. Some of the lessons learned to date include identifying: a lack of technical knowledge among tax practitioners about the Internet, conflicts between the tax practitioners' wide variety of computer hardware and software configurations and the PSMS Prototype's software, and technical problems with Internet processing and security software.

Although these lessons learned will certainly benefit the overall modernization effort, we identified several opportunities to improve the control and oversight of the PSMS Project.

Development of the Prototype Outside the Business Systems Modernization Program Is Inconsistent With Prior Audit Recommendations and the Internal Revenue Service Organization Blueprint

The PSMS Prototype is currently being developed by the ETA Office in the Wage and Investment Division. This management approach conflicts with the IRS' response to

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[1] Pub. L. No. 105-206, 112 Stat. 685, §2005.

prior audit recommendations and the IRS organization blueprint, which suggest that systems development activities be centrally managed. Specifically:

- In July 1995 and again in February 1998, the General Accounting Office (GAO) issued reports[2] recommending the IRS centralize management and control of all systems development activities under the Chief Information Officer (CIO) to enforce compliance with established system development processes and product standards. The IRS responded that the Associate Commissioner (now called Director, Business Systems Modernization) is "responsible for all aspects of modernization program planning and management, budget formulation and execution, and information systems development and management." Subsequently, the IRS established the BSM Program, which is governed and overseen by the Core Business Systems Executive Steering Committee, to provide dedicated management to acquire modernized systems.

- The *IRS Organization Blueprint 2000* states that the CIO "manages all IRS information technology (IT) resources and assumes responsibility for delivering and maintaining modernized IT systems throughout the IRS." The future IRS organization will consolidate all employees performing information systems-related work into the Information System organization under the direction of the CIO. This includes the BSM Program.

Because the PSMS Prototype provides new Customer Service functionality and includes the development of a new system that implements new technology, we believe the BSM Program in the CIO organization should control the PSMS Project. The BSM Program is currently responsible for new systems development and is developing a secure messaging system with objectives similar to the PSMS Prototype. Inclusion of the Project in the BSM Program would also provide management control and oversight consistent with that of other systems modernization activities. ETA and BSM Program management did not combine the two projects because Prototype development was already underway and moving the Prototype to BSM management was believed to be inefficient. The ETA Office has other systems development projects underway (for example, the Employer Identification Number Prototype), which may also warrant oversight by the BSM Program.

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[2] *Tax Systems Modernization – Management and Technical Weaknesses Must Be Corrected If Modernization Is to Succeed,* July 1995 (Reference Number GAO/AIMD-95-156)

Tax Systems Modernization – Blueprint Is a Good Start But Not Yet Sufficiently Complete to Build or Acquire Systems, February 1998 (Reference Number GAO/AIMD/GGD-98-54)

The Prototype Project Management Controls Can Be Strengthened

Basic project management controls (such as preparing a business case, detailed project work schedules, and interim milestone dates) were not used to help identify the complexity of the PSMS Project and address potential implementation problems. ETA management indicated that they viewed the PSMS Prototype as a short-lived part of a systems development life cycle and, therefore, did not implement some basic project management controls. Completion of the PSMS Prototype was delayed from June 2000 to September 2001, due in part to the lack of effective project management controls. In addition, the authorized costs increased from approximately $368,000 to $2.5 million.

The Prototype Project Spending Controls Can Be Improved

Review of the contractor's status reports and billing records indicated they did not always contain accurate information and sufficient detail for ETA management to verify the accuracy of the bills. ETA management had not effectively followed up on insufficient detail on the contractor's periodic billing vouchers. Therefore, management had not identified inaccurate information in the billing vouchers and could not be sure that the IRS paid for only authorized work.

Summary of Recommendations

The Core Business Systems Executive Steering Committee should merge the PSMS Prototype and other ETA-managed systems development projects with related BSM Program projects. The purpose of this merger would be to provide improved oversight and project management controls and to comply with stated goals of centrally managing the IRS' systems development activities.

If IRS management decides to allow the ETA Office to continue independent systems development activities, an approved systems development life cycle process and project management controls should be implemented and enforced. Also, the Commissioner, Wage and Investment Division, should require the contractor to provide additional supporting information on hours worked in the periodic status reports and payment vouchers, to help assure that payments are for only authorized work.

Management's Response: IRS management responded that they would:

- Not merge the PSMS Prototype or any other ETA research and development initiatives under the BSM program. IRS management will use software development life cycle activities for further PSMS Prototype enhancements, develop a project management plan, and hire a contractor to ensure project management controls are used for future ETA projects.

- Develop a shutdown strategy for the end of the PSMS Prototype and write instructions for accessing electronic records after the end of the PSMS Prototype.

- Require the contractor to provide more detailed cost information for future work, and on status reports and payment vouchers.

IRS management's complete response to the draft report is included as Appendix IV.

<u>Office of Audit Comment</u>: We believe that managing systems development projects outside the CIO organization is inconsistent with the *IRS Organization Blueprint 2000*, which consolidates all systems development activities under the CIO. Conducting ad hoc projects or prototypes outside the CIO organization increases the risk of inconsistent and ineffective project management processes and fragmented systems modernization initiatives, which could lead to delays, cost overruns and rework.

IRS management's response has been incorporated into the report where appropriate, and the full text of the response is included as Appendix IV. In addition, Office of Audit comments on IRS management's response have been included in the report and at the end of Appendix IV (page 29).

Objectives and Scope

The overall objectives of this audit were to determine whether the PSMS Prototype was managed using sound project management controls and whether the PSMS Prototype was coordinated with the IRS' BSM Program development activities.

The overall objectives of this audit were to determine whether the Practitioner Secure Messaging System (PSMS) Prototype was managed using sound project management controls and whether the PSMS Prototype was coordinated with the Internal Revenue Service's (IRS) Business Systems Modernization (BSM) Program development activities. The audit work was performed between May and August 2000 at the IRS National Headquarters in New Carrollton, Maryland. We interviewed appropriate Electronic Tax Administration (ETA), Information Systems (IS), and BSM Office managers. We also reviewed systems development documents prepared by the IRS and PSMS Prototype contractor. This audit was performed in accordance with *Government Auditing Standards*.

Details of our audit objectives, scope, and methodology are presented in Appendix I. Major contributors to this report are listed in Appendix II.

Background

The IRS Restructuring and Reform Act of 1998 (RRA 98)[1] requires the IRS to provide electronic tax account information to taxpayers who electronically file their income tax returns. In early 1998, the National Association of Enrolled Agents (NAEA)[2] proposed allowing its members to use electronic mail (e-mail) for sending information to the IRS to resolve their clients' tax issues. The IRS ETA Office, in the Wage and Investment Division, formed a work group in July 1998

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[1] Pub. L. No. 105-206, 112 Stat. 685, §2005.

[2] The NAEA is a national association of over 10,000 independent enrolled agents licensed to represent taxpayers before all administrative levels of the IRS.

*The IRS initiated the PSMS
Prototype effort to develop a
system to provide electronic
tax account information to
taxpayers' representatives.*

to determine the proposal's feasibility and started the
PSMS Prototype Project in December 1998.

ETA management initiated the PSMS Prototype as a
research and development project to:

- Determine the most productive way to receive and
  respond to tax practitioner requests for action or
  information on clients using the Internet.

- Test the technology required to secure the tax
  information.

- Gain insights that would assist future project
  expansion.

- Use the Prototype results to support the design of a
  secure messaging system that could be implemented
  on a wider scale.

Around the time that ETA management started the
PSMS Prototype Project, the IRS started renewing its
BSM efforts (previously called Tax Systems
Modernization) to provide dedicated management to
acquire modernized systems, which deliver world class
solutions to business customers. The IRS awarded the
Prime Systems Integration Services (Prime) Contract[3] in
December 1998 and started the BSM Program in
June 1999. Key points about the BSM Office include:

- The BSM Program is overseen by the Core Business
  Systems Executive Steering Committee, which is
  composed of senior IRS executives who review and
  approve major projects.

- The BSM Office in the Chief Information Officer
  (CIO) organization manages the BSM Program and
  oversees the associated projects.

- The Integrated Project Teams, composed of IRS
  business and Information Systems Product Owners

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[3] The Prime contract provides the means for the IRS to acquire
contractors' services to design, develop, and test the modernization
systems.

and a Prime contractor representative, implement the BSM projects.

One of the projects being developed by the BSM Program is called Assisted e-Services, which is developing a secure messaging system that will allow authorized tax practitioners to submit taxpayer account-related inquiries directly to the IRS via the Internet. An IRS Customer Service Representative (CSR) will issue an electronic response to the inquiry.

Results

The PSMS Prototype is the IRS' first system that uses the Internet to directly interact with the public to exchange tax information by allowing tax practitioners and IRS CSRs to submit and retrieve secure Internet messages. The PSMS Prototype includes the security and processing controls required to protect the privacy of the information, authenticate the users, and manage the requests and replies. The PSMS Prototype uses established Internet security techniques[4] and commercial off-the-shelf products to identify and authenticate the tax practitioners and IRS personnel who use the system and to protect taxpayers' information from unauthorized disclosures.

Tax practitioners started testing PSMS Prototype implementation procedures in February 2000. As of August 14, 2000, 53 tax practitioners (out of 104 invited to participate in the Prototype) were testing or had completed the tests and started to send inquiries about

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[4] The PSMS uses Public Key Infrastructure (PKI) and Secure Socket Layers (SSL) to secure the messages. "PKI" is a system of digital certificates, Certificate Authorities that issue them, and other registration authorities that verify and authenticate the validity of each party involved in an Internet transaction. A "digital certificate" is an attachment to an electronic message used to verify that a user sending a message is who he or she claims to be and to provide the receiver with the means to encode a reply. "SSL" is a format for transmitting private documents via the Internet.

their clients' tax accounts. The purpose for developing the PSMS Prototype is to provide information to the IRS' Assisted e-Services Project, which includes a secure messaging component. ETA management prepared a plan to gather Prototype results that include user satisfaction statistics, suggestions for improvement, and lessons learned. For example, the PSMS Prototype has identified:

- The lack of tax practitioner technical knowledge about the Internet (e.g., implementation of security procedures).

- Conflicts between the tax practitioners' wide variety of computer hardware and software configurations and the PSMS Prototype's software (e.g., tax practitioners' use different brands of hardware and software in different combinations, which are not always compatible with the IRS' software). In addition, IRS and practitioners' tests determined that one of the most widely used Internet browser programs was not compatible with the PSMS Prototype, which required some practitioners to implement different browser software.

- Technical problems with Internet processing and security software (e.g., security software that met IRS security requirements was not compatible with certain Internet software until the security software vendor issued a correction).

The lessons learned will benefit the overall IRS systems modernization effort and should allow the Assisted e-Services Project to avoid or be better prepared to deal with similar problems.

The audit identified opportunities for improving project and spending controls.

However, the audit identified the following areas for improvement:

- Management of the PSMS Prototype and other ETA systems development initiatives by the BSM Program would make project management consistent with prior audit recommendations and the IRS' organization blueprint.

- Better use of project management controls would
  help IRS managers ensure that developmental
  problems and delays are timely identified and
  effectively resolved.

- More comprehensive billing information would help
  ETA management assure that the IRS pays for only
  authorized work.

Development of the Prototype Outside the Business Systems Modernization Program Is Inconsistent With Prior Audit Recommendations and the Internal Revenue Service Organization Blueprint

The PSMS Prototype is currently being developed by
the ETA Office in the Wage and Investment Division
along with other systems development projects (e.g., the
Employer Identification Number Prototype). This
management approach conflicts with prior audit
recommendations and the IRS organization blueprint,
which suggest that all systems development activities be
managed centrally. Specifically:

*Two prior GAO reports
recommended centralization
of systems development
activities.*

- In a July 1995 report *Tax Systems Modernization –
  Management and Technical Weaknesses Must Be
  Corrected If Modernization Is to Succeed*
  (Reference Number GAO/AIMD-95-156), the
  General Accounting Office (GAO) reported that
  "Historically, accountability and authority for
  systems development and operation were fragmented
  among IRS' Modernization Executive, Chief
  Information Officer, and research and development
  division." The GAO recommended that the IRS
  centralize "management and control responsibility
  for all systems development activities, including
  those of IRS' research and development division."
  The IRS responded that the Associate Commissioner
  (now called Director, Business Systems
  Modernization) is "responsible for all aspects of
  modernization program planning and management,

budget formulation and execution, and information systems development and management."

- In February 1998, the GAO revisited the centralization issue in the report *Tax Systems Modernization – Blueprint Is a Good Start But Not Yet Sufficiently Complete to Build or Acquire Systems* (Reference Number GAO/AIMD/GGD-98-54). The GAO reported that "The CIO does not control all information systems activity and thus cannot effectively enforce compliance with established system process and product standards. In particular, the CIO does not have budgetary and organizational authority over all IRS systems development, research and development, and maintenance activities." The GAO recommended that the Commissioner "give the CIO:

  - ➢ "Responsibility for developing, implementing, and enforcing SLC [Systems Life Cycle[5]] processes and products across IRS.

  - ➢ "Requisite budgetary and organizational authority over all IRS systems development, research and development, and maintenance activities."

  On January 26, 1998, the IRS Commissioner replied that he intended "to address these issues in the coming months."

- As previously discussed, the IRS established the BSM Program to oversee the modernization of the IRS' computer systems. In addition, the IRS is currently in the process of consolidating all employees performing information systems-related work into the Information Systems organization under the direction of the CIO. The *IRS Organization Blueprint 2000* (Document 11052,

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[5] A systems life cycle defines the policies, processes, and products for managing information technology investments from conception, development, and deployment through maintenance and support.

revised April 2000) states that the CIO "manages all IRS information technology (IT) resources and assumes responsibility for delivering and maintaining modernized IT systems throughout the IRS." This includes the BSM Program. The new CIO organization will include a systems development organization that acts as a shared service.

The Congress set up a separate account to fund systems modernization. Because the IRS currently considers the PSMS Prototype as a research and development project, it is being funded out of the general operations account.

To ensure that the IRS implemented required systems modernization planning and control procedures, the Treasury and General Government Appropriations Act of 1998[6] required the IRS to submit to the Congress an approved expenditure plan for capital investment funds (called the Information Technology Investment Account, ITIA). In addition to establishing procedures for the approval of IRS modernization funds, this Act authorized general operations funds for the IRS and provided that "…none of the funds under this heading [IS operations], …may be obligated …to implement the Internal Revenue Service's *Modernization Blueprint*…." The Congress did not indicate that it changed its intent for obligations from either of these funds when it passed subsequent appropriations acts.

The PSMS Prototype provides new Customer Service functionality and does not directly support existing electronic filing operations. The Project has the characteristics of a systems modernization project because it implements new technology and processes (e.g., Internet transactions and related security controls) for an IRS business requirement (e.g., responding to tax account requests).

In September 1999, after PSMS Prototype development had started, the BSM Program started the Assisted e-Services Project to develop a full-scale secure messaging system that will be similar to the PSMS Prototype. ETA and BSM Program management did not combine the two Projects because Prototype

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[6] Pub. L. No. 105-61, Title 1.

development was already underway and moving the Prototype to BSM management was believed to be inefficient. Rather than combining the Projects, management assigned the two PSMS Prototype Team Leaders as the Assisted e-Services Project Product Owners (the modernization term for the systems' users) to transfer their knowledge. However, as of June 2000, the PSMS Prototype team had not documented the Prototype results and ETA management had extended the PSMS Prototype development until September 2001, to collect additional information.

ETA management views the PSMS Prototype as a research and development effort to learn as much as possible about secure messaging and will provide its results to the Assisted e-Services team. Although they agreed that a prototype is part of an overall system development project, they drew a distinction between prototype development and systems development. The ETA Office managed the PSMS Project with IS managers providing support for the Prototype development but not project management. In addition, IRS management did not formally oversee the PSMS Prototype Project with an executive steering committee.

ETA management spent at least $1.2 million of IRS operations funds to develop the PSMS Prototype and budgeted an additional $1.3 million to be spent on it before the end of FY 2001. Developing the PSMS Prototype within the BSM Program could have made it eligible for ITIA funds.

The ETA Office included the funds to develop the PSMS Prototype in its Fiscal Year (FY) 1999 and 2000 operations budget requests. These requests stated that the funds were for private sector contracts and agreements to continue ETA's activities. As of June 9, 2000, the Project had cost at least $1.2 million. In addition, ETA management has budgeted an additional $1.3 million to be spent on the Project, including $567,000 for the remainder of FY 2000 and $755,000 in FY 2001.

The BSM Program should control the PSMS Prototype. This would allow the Project to (1) more closely comply with the Congress' intent that the IRS use only ITIA funds for systems modernization activities, (2) conform to the *IRS Organization Blueprint 2000* that centralizes all systems development activities, and (3) provide consistent controls and oversight over the development

activities. With BSM Program control, the PSMS Prototype project could be eligible for funding from the ITIA.

The Prototype Project Management Controls Can Be Strengthened

The Office of Management and Budget (OMB) Circular A-130, *Management of Federal Information Resources*, requires all agencies to establish a control process to monitor performance of information systems investments and makes the CIO responsible for implementing this investment management and oversight process. The IRS has historically required project management procedures and a systems development life cycle methodology for all systems development projects.

ETA management did not implement effective project management controls.

The ETA Office managed the PSMS Prototype Project but did not implement formal systems life cycle procedures. During PSMS Prototype development, the IS organization provided support but did not assign a project manager to run the Project. Discussions with ETA management indicated that they viewed the PSMS Prototype as a short-lived part of a systems development life cycle and relied on the contractor to manage the PSMS Project. Therefore, they did not implement certain basic project management controls. For example, the Project Team did not prepare a business case or detailed project work breakdown schedules, including interim milestone dates. In addition, ETA management did not conduct formal milestone reviews of documents such as the *Detailed System Description* to help identify the complexity of the Project and address potential implementation problems. This ultimately contributed to PSMS Project delays and increased costs.

The lack of effective project management controls resulted in an ineffective Requirements Analysis Process, delayed delivery of a stable and useable system, inadequate instructions for retrieving stored messages, and increased costs.

The audit identified the following PSMS Prototype development problems:

- An effective process to develop prototype requirements was not conducted before the contractor started developing the PSMS Prototype. IRS subject matter experts met with the contractor, and the contractor prepared the functional requirements and the design specifications (in the *Detailed System Description*) based on these meetings. However, ETA management did not formally review and approve the *Detailed System Description* as the finalized document that had to be implemented by the contractor. As a result, they could not measure the contractor's completion of the Prototype's development tasks.

- In addition to the requirements not being finalized, the Work Request for the contractor to develop the PSMS Prototype did not cite required security standards but instead referenced a "Verbal list of system requirements" as the source for Government-furnished information. As a result, not all security requirements were properly identified. For example, a preliminary security review conducted by another contractor team found that planned encryption techniques did not comply with a Treasury Department Security Manual[7] standard and would have left taxpayer information vulnerable to disclosure. The contractor had to redesign the security control and the IRS had to acquire additional security software that complied with the standards. The late acquisition and implementation process delayed completion of the Project and increased the Project costs.

- The *Detailed System Description* included the record layouts for the forms that contain the practitioner's question or request and specified the information

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[7] Office of Security Manual, TD P 71-10, Chapter VI, Number 3.A, revised October 1, 1992.

that the practitioner would be required to provide. However, the tax period was not always required, although it is needed to verify that the taxpayer's Power of Attorney entitles the practitioner to receive the tax information and to ensure that the CSR responds accurately.

Completion of the PSMS Prototype was delayed from June 2000 to September 2001, due in part to additional development efforts to correct identified security and functionality problems.

- The PSMS Prototype stores a record of the tax practitioners' messages and the associated IRS responses in a researchable format, as required by IRS Record Administration guidelines. However, the Requirements Analysis Process did not include a requirement for written instructions to IRS computer systems users (who respond to taxpayer account and compliance issues and cases) for researching the stored messages. In addition, PSMS Prototype documentation does not indicate how the stored messages will be maintained or accessed after the Prototype is shut down. Researchable stored messages are required so that, if necessary, IRS personnel can research them at a later date.

- From October to early December 1999, IRS testing identified problems that were given to the contractor to correct. In December 1999, the contractor turned the system over to the IRS as ready-to-use. However, additional IRS testing identified significant problems that the contractor's testing procedures did not identify. For example, the IRS testers could not retrieve all messages that were entered, information in some messages was altered by the system or not displayed accurately, and Internet forms that the practitioners would use to prepare their messages did not ensure that all required information was entered. As a result, the contractor had to redesign the system's functionality.

Completion of the PSMS Prototype was delayed from June 2000 to September 2001, due in part to additional development efforts to correct identified security and functionality problems. The authorized costs also

increased from approximately \$368,000[8] to \$2.5 million[9] (including \$755,000 budgeted in FY 2001 operations funds).

The Prototype Project Spending Controls Can Be Improved

OMB Circular A-130 requires a process to be established to monitor performance of information systems investments, including budget and spending controls. Also, the Federal Managers' Financial Integrity Act of 1982 (FMFIA)[10] requires Federal agencies to implement internal accounting and administrative controls that provide reasonable assurances that expenditures are recorded and accounted for to maintain accountability over the assets.

Estimates of the total cost or time to develop the PSMS Prototype were not prepared because the Project was considered a prototype that involved uncertainty. In addition, billing information provided by the contractor made it difficult for management to assure that the contractor was paid for only work authorized through the several contract modifications issued by the IRS. Specifically, we found:

- The initial Work Request, issued in May 1999, required the contractor to:

  - ➢ Validate system requirements with IRS personnel and document the system design (*Detailed System Description*) by June 1999.

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[8] This figure is based on contractor work authorized in May 1999, computer hardware and software acquired, and IRS staff costs during this period.

[9] This figure is based on actual spending through June 9, 2000, plus budgeted spending through FY 2001.

[10] Pub. L. No. 97-255.

> ➢ Prepare a user guide and *System Maintenance and Management Plan* by August 1999.

> ➢ "Design, integrate, test, and deploy" the computer system for tax practitioners to submit Internet messages and for CSRs to retrieve them and send responses back to the practitioners by September 1999.

We estimate that the PSMS Prototype was initially authorized to cost approximately $368,000.

The Work Request authorized payment to the contractor for up to a certain number of labor hours to accomplish these tasks. We estimated that the contractor's work would cost about $152,000. In addition, the hardware and software needed to develop and operate the PSMS Prototype cost the IRS about $36,000, and IRS staff costs were approximately $180,000. Therefore, we estimate that the PSMS Prototype was initially authorized to cost approximately $368,000.

- In November 1999, ETA management modified the Work Request. The modification required the contractor to:

> ➢ Complete the delayed deployment of the system by November 1999, including CSR training.

> ➢ Update the System Design Document by October 1999 and publish "volume 2 of the System Design Document" by April 2000.

> ➢ Prepare additional user guides and spread their publication between October 1999 and March 2000.

> ➢ Prepare security test plans, conduct the tests, and prepare the reports needed to obtain a security certification by September 2000.

> ➢ Provide full-time Help Desk support and operations and maintenance tasks through January 2001.

- In March 2000, ETA management again modified the Work Request and requested additional work. The modification required the contractor to:

➢ Complete several previously required tasks with extended completion dates.

➢ Establish a development and testing environment at the contractor's location and enhancement procedures by March 2000.

➢ Develop and test a list of system enhancements. The IRS did not establish a completion date for these enhancements and plans to schedule them for future deployment.

The two modifications authorized payment for up to a certain number of labor hours, which we estimated would cost approximately $1.6 million.

Through June 9, 2000, the IRS had spent about $1.2 million for contractor support to develop and operate the PSMS Prototype, IRS labor, and acquisition of necessary hardware and software. In addition, the IRS budgeted approximately $567,000 for the remainder of FY 2000 and $755,000 for FY 2001 bringing the total Project cost to about $2.5 million (including the $1.6 million for authorized work request modifications).

Because periodic status reports and payment vouchers could not be reconciled, ETA management could not ensure that the IRS had appropriately paid the contractor.

ETA management could not assure that the contractor was paid for only authorized work because they had not effectively followed up with the contractor to obtain details left out of the periodic billing vouchers. Therefore, ETA management had not identified inaccuracies in the information included in the billing vouchers. The contractor is paid on the basis of the work identified in PSMS Prototype status reports and the amount billed on the payment vouchers. ETA management and IRS contract administration personnel routinely review and approve these documents before reimbursing the contractor for completed work. However, the status reports could not be reconciled to the payment vouchers for the hours worked. The status reports identified the work accomplished and the total hours billed during the period but did not break the total down by task. The contractor's payment vouchers included the total hours billed for multiple IRS projects

but did not break the total down for each project (e.g., PSMS Prototype).

During the audit, we questioned whether the IRS had inappropriately paid the primary contractor up to $169,000 to correct programming design and development errors. Previously, the contractor's executive managers agreed in a meeting with IRS executives to not bill the IRS for the hours that their personnel worked to correct problems identified by IRS testing. However, during the period from December 1999 through January 2000, the contractor continued to bill the IRS for work completed. Many of the tasks identified on the contractor's status reports for this period could be associated with the redesign (e.g., testing and implementing changes).

In response to our questions about the "billable" versus "unbillable" hours, the contractor reported that additional personnel were assigned to correct the problems and 475 work hours were not billed. According to the contractor's status reports, it billed the IRS for 1,955 hours during the same period.

Comparison of these reports to the two payment vouchers that the contractor submitted for the same period indicated that "unbillable" hours might have been billed. ETA management followed up with the contractor and indicated that differences occurred because the contractor's internal system did not report accurate information. The following information was not accurate:

- One contractor employee's "billable" hours were reported as cumulative hours, not current hours, in the detailed information attached to one payment voucher. The contractor indicated that the hours were erroneously not reported in the previous period and were "plugged" in the total hours billed for the subsequent period. The contractor's response is inconsistent with the detailed information attached to the payment vouchers that identify a significant number of contractor employees whose work was conducted in previous periods but reported in the

current hours column of the payment vouchers. Also, the number of "billable" hours for this employee was the same as the number reported as "unbillable."

- In two of three payment vouchers, the current hours billed for three Labor Categories were not accurately added to the cumulative hours reported at the end of the previous period. The contractor told ETA management that its system was being corrected to accurately add the cumulative totals.

In addition, the format of the payment vouchers and status reports did not provide sufficient detailed information to assure that IRS was paying for only authorized work. For example:

- The detail attached to the payment vouchers did not always provide totals that could be easily added to verify the amounts billed on the invoices. One detail attachment explained how the "Other Direct Costs" listed were calculated and brought forward to the payment voucher. However, none of the vouchers provided this type explanation for the labor costs.

- The status reports did not identify the tasks that were accomplished by personnel during the 1,955 hours that were billed to the IRS.

- The detailed information attached to the payment vouchers did not break down by individual project the labor and other costs billed.

ETA management could improve their control over the Project's cost and better ensure the accuracy of the contractor's payment vouchers if the status reports and payment vouchers provided more detailed, project-specific information.

Recommendations

1. The Core Business Systems Executive Steering Committee should merge the PSMS Prototype and other ETA-managed systems development projects

with related BSM projects. The purposes of this merger would be to provide improved oversight and project management controls and to comply with stated goals of centrally managing the IRS' systems development activities. If IRS management decides to allow the ETA Office to continue independent systems development activities, the Commissioner, Wage and Investment Division, should implement and enforce a systems development life cycle process and project management controls.

Management's Response: The Commissioner, Wage and Investment Division did not agree that PSMS or any other ETA research and development initiative should be merged under the BSM program. He stated that IRS management has created an investment decision management process that allows the identification, ranking, and selection of large, medium, and small-scale improvement projects. This allows medium and small-scale improvement projects to proceed in tandem with the modernization effort [outside the CIO's organization].

All further enhancements of PSMS will be subjected to software development lifecycle activities. ETA and IS management will develop a project management plan for the PSMS Prototype. In addition, ETA management has hired a contractor to ensure project management controls are used for future ETA projects.

Office of Audit Comment: The investment decision management process described above was designed to rank the IRS' overall business needs to determine which projects would be funded. We believe the intent of this process is that all prioritized and funded projects to be managed centrally by the CIO, not by separate systems development groups in the IRS' business units.

In addition, management has already hired a contractor under the Prime Contract to assist the IRS in implementing a systems development life cycle

approach (called the Enterprise Life Cycle). It is unclear why the IRS would need to hire another contractor to ensure improved project management controls are used for future ETA projects.

Therefore, the Office of Audit still believes the PSMS Prototype and other ETA-managed systems development projects should not be managed by the business unit organizations, such as the Wage and Investment Division. Management of systems development activities in the CIO organization, where the proper skills and contracts already exist, would seem to be more efficient for the IRS and help prevent wasted funds.

Finally, management's response cites Internal Revenue Manual 2553.23 (Small-Scale Applications Handbook) as the software development life cycle procedure to be followed for further enhancements. This Handbook applies to small systems development projects that (1) will cost less than one staff year to develop and (2) are not tax related projects. The PSMS Prototype does not meet the criteria for small-scale applications as it is a multi-year systems development project that is used to transmit, manage, and store tax information. When the PSMS Prototype development was initiated, Document 7924, Enhanced Systems Development Life Cycle, and Document 7362, Software Prototyping Methodology, provided guidelines for prototype development. Currently, the Enterprise Life Cycle (ELC) defines the policies, procedures, responsibilities, and standards required for IRS business systems modernization projects. The ELC incorporates major high-level milestones that can be tailored as appropriate.

2. The IRS should develop written instructions for operations personnel (e.g., Customer Service, Compliance, etc.) to ensure that they can research the stored PSMS Prototype messages and IRS responses, including accessing the records after the PSMS Prototype is shut down.

Management's Response: IRS management plans to develop a shut-down strategy for the end of the PSMS Prototype, which will include written instructions for accessing electronic records after the end of the PSMS Prototype.

3. The Commissioner, Wage and Investment Division, should require the contractor to break down the total hours worked by task on each status report, break down by individual project the labor hours and other costs billed on each payment voucher, report as "current" (not "cumulative") all costs that are included on the payment voucher with an appropriate comment when the costs apply to another accounting period, and report the amount billed for each person's current hours. This information should be used to assure the IRS is paying for only authorized development work.

Management's Response: IRS management will require the PSMS contractor to provide more detailed information for future work, and on status reports and payment vouchers.

IRS management's complete response to the draft report is included as Appendix IV.

Conclusion

ETA management developed the PSMS Prototype to support the design of a full-scale secure messaging application. The PSMS Prototype Project has identified a number of lessons learned that will be useful to the related BSM Program Assisted e-Services Project. However, project management and spending controls can be improved.

Detailed Objectives, Scope, and Methodology

The overall objectives of this audit were to determine whether the Practitioner Secure Messaging System (PSMS) Prototype was managed using sound project management controls and whether the PSMS Prototype was coordinated with the Internal Revenue Service's (IRS) Business Systems Modernization (BSM) Program development activities.

I.   We reviewed PSMS Prototype Project management controls to determine whether PSMS Prototype development activities are consistent with Enterprise Life Cycle (ELC) requirements, were effectively coordinated with the BSM Program, and were effectively managed to produce results that will be useable by the Prime Systems Integration Services (Prime)[1] contractor when it integrates the secure messaging system into the modernized environment.

    A.   We determined whether IRS management established and communicated a clear policy for using the ELC methodology to develop prototypes such as the PSMS Prototype.

    B.   We determined whether the PSMS Prototype development activities, milestone documentation, and management reviews were substantively consistent with the ELC requirements.

    C.   We determined whether the PSMS Prototype Project Team and Electronic Tax Administration (ETA) management effectively communicated and coordinated the PSMS Prototype development activities with the BSM Office.

    D.   We determined whether the PSMS Prototype Project Team and ETA management effectively managed the Prototype development activities to produce results useable by the Prime contractor.

II.   We reviewed PSMS Prototype Project planning documents and the IRS' budget and spending reports to identify the funding sources for the PSMS Prototype, the cost of the PSMS Prototype development, and the costs that may be duplicated when the Prime contractor develops the secure messaging system.

    A.   We identified and reviewed IRS budget and spending guidelines (i.e., operations funds, Information Technology Investment Account (ITIA), etc.) to identify the criteria for using ITIA funds for IRS

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[1] The Prime contract provides the means for the IRS to acquire contractors' services to design, develop, and test the modernization systems.

modernization and to determine whether operations funds may be used for prototype modernization efforts.

B.   We identified the funding source for and amount of the following costs attributed to the PSMS Prototype:

1.   Contractor costs (e.g., development, security testing, etc.).

2.   PSMS Prototype Project Team and other IRS staff costs.

3.   Digital certificate, computer hardware, and software acquisition costs.

Major Contributors to This Report

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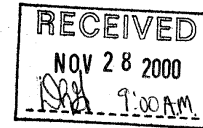   Office of Information Systems Program Oversight IS:IR:O

Management's Response to the Draft Report

Note: Office of Audit comments supplementing those in the report text appear at the end of the appendix.

DEPARTMENT OF THE TREASURY
INTERNAL REVENUE SERVICE
WASHINGTON, D.C. 20224
November 28, 2000

RECEIVED
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_____ 1:00 AM

MEMORANDUM FOR DEPUTY INSPECTOR GENERAL FOR TAX ADMINISTRATION

FROM: John M. Dalrymple
Commissioner, Wage and Investment Division

SUBJECT: Draft Treasury Inspector General for Tax Administration (TIGTA) Audit Report – Controls Over the Development of the Practitioner Secure Messaging System Prototype Should Be Improved

Thank you for the opportunity to respond to your draft report titled, "Controls Over the the Development of the Practitioner Secure Messaging System (PSMS) Prototype Should Be Improved." We are pleased the report acknowledges the lessons learned, which will benefit the overall modernization effort and will contribute to the success of the Assisted e-services modernization project. In line with the Electronic Tax Administration's (ETA) goal, the functionality of the PSMS Prototype will revolutionize how practitioners, and ultimately taxpayers, transact and communicate with the IRS.

The PSMS prototype was the result of a request from private industry in response to a Request for Agreement issued by ETA in November 1997. Tax practitioners wanted to have the capability to securely communicate with the IRS electronically. The PSMS Prototype served as the vehicle for securing vital customer input before finalizing the production version requirements. It also furthered our strategic goal to partner with the private sector.

In July 1998, the IRS established a Working Group that partnered with representatives from IRS Information Systems, Customer Service, ETA, Collection, Examination, Privacy Advocate, and Compliance Research. Oversight of the Prototype included periodic status meetings chaired by the CIO with the Deputy CIO and ETA's Assistant Commissioner. We had detailed discussions on the status and future plans for the Prototype. Before implementing the prototype, we briefed the IRS Commissioner, the Department of the Treasury, the Office of Management and Budget, the General Accounting Office, and members of Congress. The TIGTA office declined a briefing.

The PSMS prototype also responds to recommendations made by the Electronic Tax Administration Advisory Committee (ETAAC). In its Annual Report to the Congress dated June 30, 2000, which said, "Congress must appropriate adequate resources and authority for pilots and prototypes, enabling a quick response to rapid changes in the electronic commerce marketplace."

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In our review of the draft report, we identified the following items that need clarification:

See comment 1

- Page 2: "The PSMS Prototype started in December 1998."

  The Working Group for the PSMS Prototype convened in July 1998.

See comment 2

- Page 10: "An effective process to develop requirements was not conducted before the contractor started developing the PSMS Prototype."

  We hired a contractor to help us develop requirements shortly after the Working Group was established. The ETA never intended to provide the contractor with a finalized set of requirements. A Prototype allows you to learn during the process and modify the system based on the lessons learned. Following best practices, the PSMS design was not "frozen." A Prototype such as this allows for iterative development. When an inflexible process is followed, design defects often result in delivering a system that does not meet the customers' needs.

See comment 3

- Page 11: "Completion of the Prototype was delayed from June 2000 to September 2001 due, in part, to additional development efforts to correct identified security and functionality problems."

  The end date for the Prototype was never established to be September 2001. Initially, the PSMS Prototype was intended to function for one year from the start date. However, because it was going to be handling sensitive but unclassified (SBU) data, ETA did not activate the prototype for tax practitioners until all of the test results were positive. Testing continued until we identified and resolved all systems problems.

Now on page 11
See comment 4

- Page 12: "The authorized costs also increased from approximately $368,000 to $2.5 million."

  The authorized costs for the project were never estimated at $368,000. That was the budgeted amount for the first year of the project. The $2.5 million reflects ETA's budget request for fiscal years 1999, 2000, and 2001. Those costs include developing the detailed requirements, designing the system to meet security requirements, purchasing hardware and software for the system, testing the system at every phase, training customer service employees on system use and help desk procedures, and operating and maintaining the system after implementation.

IDENTITY OF RECOMMENDATION/FINDING #1:
The Core Business Systems Executive Steering Committee should merge the PSMS Prototype and other ETA-managed systems development projects with related Business

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Systems Modernization (BSM) projects. The purpose of this merger would be to provide improved oversight and project management controls and to comply with stated goals of centrally managing the IRS' systems development activities. If IRS management decides to allow the ETA Office to continue independent systems development activities, the Commissioner, Wage and Investment Division, should implement and enforce a systems development life cycle process and project management controls.

ASSESSMENT OF CAUSE(S):
The PSMS prototype was well underway before the Prime Alliance contract was awarded. The PSMS prototype began in July 1998. The Assisted e-Services Integrated Product Team, which is responsible for providing the PSMS functionality for the modernization effort, did not begin until September 1999. The IRS planned to use the prototype to provide input into the requirements phase of the modernization work.

CORRECTIVE ACTIONS:
We agree PSMS and all information systems development have the proper oversight and project management controls. However, the CIO, not the BSM Office, is responsible for managing and delivering of information systems throughout the IRS. We do not agree PSMS or any other ETA research and development initiative should be merged under the BSM program. We have created an investment decision management process that allows us to identify, rank, and select large, medium, and small-scale improvement projects. It allows us to move forward on medium and small scale improvement efforts in tandem with the modernization effort. Projects such as PSMS fall within these parameters and provide valuable information for developing customer requirements for longer-term modernization efforts. Some information systems development initiatives fall under the responsibility of the CIO and will be subjected to the proper project management discipline and oversight. All further enhancements of PSMS will be subjected to software development life cycle activities found in IRM 2500, specifically IRM 2553.23, which describes activities for small scale ADP project development and project management disciplines. Enterprise Life Cycle project management disciplines will be applied as appropriate.

The ETA and IS will build a project management plan to ensure the PSMS Prototype uses a systems development life cycle methodology and strong project management controls. The ETA has hired a contractor to ensure improved project management controls are used for future projects.

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IMPLEMENTATION DATE: October 1, 2001

RESPONSIBLE OFFICIAL(S):
Chief Information Officer
Director, Electronic Tax Administration

IDENTITY OF RECOMMENDATION/FINDING #2:
The IRS should develop written instructions for operations personnel (e.g., Customer Service, Compliance, etc.) to ensure that they can research the stored PSMS Prototype messages and IRS responses, including accessing the records after the PSMS Prototype is shut down.

ASSESSMENT OF CAUSE(S):
We have discussed a process for researching the stored PSMS Prototype messages and IRS responses and accessing the records after the PSMS Prototype is shut down. However, we have not developed written instructions because we have not finalized details for storing and accessing the records.

CORRECTIVE ACTIONS:
We planned to develop a strategy for shutting down the project that would include written instructions for accessing the records at the completion of the project. We will develop written instructions to ensure all electronic records can be accessed at the end of the PSMS Prototype. We have a database that stores all of the PSMS records. We can access the database using Microsoft Access software, which is currently available. We will evaluate information on data storage and accessibility to decide: who will be authorized to access the data, how long the data must be stored, what format the data will be stored in, and where the data will be located. Also, while the Prototype is operational, we can access the data and perform research on all of the information in the system.

IMPLEMENTATION DATE: April 1, 2001

RESPONSIBLE OFFICIAL:
Director, Individual Electronic Filing Division

IDENTITY OF RECOMMENDATION/FINDING #3:
The Commissioner, Wage and Investment Division, should require the contractor to break down the total hours worked by task on each status report, break down by individual project the labor hours and other costs billed on each payment voucher, report as "current" (not "cumulative") all costs that are included on the payment voucher with an appropriate comment when the costs apply to another accounting period, and report the amount billed for each person's current hours. This information should be used to assure the IRS is paying for only authorized development work.

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ASSESSMENT OF CAUSE(S):
Due to the dynamic nature of the prototype development, the contract did not include procedures for reporting hours worked by task or other billed costs.

CORRECTIVE ACTIONS:
The IRS will put controls in place requiring the PSMS contractor to provide adequate detail on scope, schedule, and cost for future work. Status reports that provide a break down of total hours worked by task and detailed payment vouchers will be required. We will identify specific matrix requirements in the contract based on the scope and nature of the work to be performed.

IMPLEMENTATION DATE: April 1, 2001

RESPONSIBLE OFFICIAL:
Director, Field Operations Division

If you have any questions, members of your staff can contact JoAnn Blank, Director, Individual Electronic Filing Division, at (202) 283-4790.

Office of Audit Comments

The following information is provided to clarify statements contained in the Internal Revenue Service's (IRS) management response dated November 28, 2000.

1. Formation of the working group in July 1998 was reported on page 1 of the report.

2. The audit report showed (pages 10 and 11) that the PSMS Prototype development was flawed because ETA management did not review and approve the requirements that were given to the contractor. Requirements are needed to measure progress and hold the contractor accountable for delivery of the PSMS Prototype. Management reviews are intended to identify defects such as described in the audit report and to correct them as early as possible.

    IRS management stated in the response that the prototyping process must remain flexible to be effective and that finalizing requirements would freeze the design and prevent changes indicated by the lessons learned. However, current IRS system development guideline documents address prototype development activities in a different light:

    *   The Enterprise Life Cycle (ELC) defines the policies, procedures, responsibilities, and standards required for IRS business systems modernization projects. The ELC includes prototyping techniques that can be used during the development phase of a systems development project. The ELC also permits flexibility in the project management and system development controls that are used in a prototype development project.

    *   Document 7362, Software Prototyping Methodology, states that the Requirements Analysis Package is "the primary input to the prototyping project…Prototyping does not eliminate the need for thorough documentation. Written documentation…describes the evolving prototype at the appropriate level of detail and provides necessary information to managers, developers, and system users."

    *   Document 7924, enhanced Software Development Life Cycle (eSDLC) (revised July 1993) outlines a continuing life cycle of requirements definition, design, development, installation, and review for systems development projects. During the development phase, prototyping is an option. Document 7924 states that "Use of prototyping does not excuse the preparation of eSDLC deliverables." This document also cross-references the prototyping sections to Document 7362, Software Prototyping Methodology (described above).

3. During the audit, ETA managers cited the June 2000 and September 2001 dates as their original and current completion dates, respectively. The implementation was delayed until the problems were corrected. However, the additional development efforts and the resulting 15-month extension of the project completion were partially

caused by the lack of strong project management controls. We also note that management's response indicates that the PSMS Prototype will continue to run past September 2001.

4. The Office of Audit determined the $368,000 and $2.5 million estimates and the audit report explains how the estimates were calculated (see pages 12 – 14). The $2.5 million estimate included budgeted amounts for Fiscal Years 2000 and 2001.